DOCUMENT RESUME

ED 185 969 IR 008 293

AUTHOR Persson, Olle
TITLE Critical Comments on the Gatekeeper Concept in Science and Technology.
INSTITUTION Royal Inst. of Tech., Stockholm (Sweden). Library.
REPORT NO TRITA-LIB-6017
PUB DATE Jan 80
NOTE 16p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Communication (Thought Transfer); *Information Dissemination; *Organizations (Groups); *Sciences; *Technology
IDENTIFIERS *Gatekeeper Role; *Scientific and Technical Information

ABSTRACT

The criticism of the two-step flow model of information dissemination in mass media research should also apply, this paper argues, to studies of gatekeepers in R & D (research and development) organizations: the 2-step flow model does not tell us with whom the gatekeeper is communicating, what is being discussed, or what effect the gatekeeper has on internal informal dissemination. Using an empirical study of an R & D organization, the thesis is presented that gatekeepers can contribute to an elitist pattern of distribution rather than to a reduction of the information gap. Finally, it is suggested that studies of internal communication in R & D organizations should deal with communication relationships rather than individuals as units of analysis. (Author)

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REPORT TRITA-LIB-6017 JANUARY 1980

ED185969

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CRITICAL COMMENTS ON THE GATEKEEPER CONCEPT IN SCIENCE AND TECHNOLOGY

Olle Persson

Inforsk
Department of Socioiogy
University of Umeå

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IR008293

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Abstract

The concept of the gatekeeper as a means of improving information dissemination in science and technology, has been given much attention. The criticism of the two-step flow model has been extensive in mass media research. In principle, this criticism should also apply to studies of gatekeepers in R & D organizations. The two-step flow model does not tell us whom the gatekeeper is communicating with, what is being discussed, and what effect the gatekeepers have on the internal information dissemination. Using an empirical study of an R & D organization, the thesis is presented that gatekeepers can contribute to an elitistic pattern of distribution rather than to a reduction of the information gap. Finally, it is argued that studies of internal communication in R & D organizations should deal with communication relationships rather than with individuals as units of analysis.

Introduction

About thirty years ago the two-step flow hypothesis was formulated for the first time by Lazarsfeld et al (1944):

> "... ideas often flow from radio and print to opinion leaders and from them to the less active sections of the population." (p 151)

The two-step flow hypothesis has been given much attention especially in mass media research. It has been observed that mass media does not have a direct and independent effect on its audience. The individual recipient is in-

fluenced to at least the same extent by the interpretations and evaluations which neighbours, colleagues, etc have of the messages which are distributed via mass media. The interplay between mass media and interpersonal communication has established a starting point for much research.Especially the role of the opinion leaders has been observed as being a possibility to strengthen the effects of messages which have been sent. The interest in the two-step hypothesis has now abated and in many quarters its universality and value as a model for information dissemination has been questioned.

Against this background it is surprising to see the almost indiscriminate reception of the application of the two-step flow hypothesis in studies of scientific and technological information dissemination.

Holland (1974) was able to identify about ten so-called special communicators who can be assumed to serve similar purposes as the opinion leaders in the two-step flow model: great man, scientific troubadour, linker, information specialist, internal consultant etc.

The communicator that has attracted most attention in science and technology is the gatekeeper, that was introduced by T J Allen in the late nineteen sixties (Allen 1977). The gatekeeper, who on the basis of good contact with external information sources supplies his colleagues with information, is considered to be a key person in an R & D organization. The similarities to the opinion leader conception are obvious and Allen also maintains that the phenomenon of the gatekeeper is a very general one:

> "The phenomenon of the gatekeeper is not an isolated one. Rather it is one example of a much more general class of phenomena. There will always be some people who, for various reasons tend to become more acquainted with information sources outside their immediate community. They either read more extensively than most or develop personal contacts with outsiders. A large proportion of these people in turn attract colleagues from within the community who turn to them for information and advise." (Allen 1977, p 153)

A common recommendation, that has been stated in order to improve the information dissemination in R & D organizations, is that the gatekeepers are to be identified and the information dissemination is to be concentrated around them. With a touch of dogmatism, Allen asserts that:

> "All a good manager has to do is to be sensitive to the concept. He will find his gatekeepers. The only thing remaining is to reward them, organize information dissemination around them, and if they are lost by promotion, replace them." (Allen 1977, p 180)

On an intuitive level, this solution appears reasonable - an already established pattern of communication is built upon, the gatekeepers' exposure to external information and his internal contacts are stimulated.

However, on the basis of only this simple model, it is very difficult to say which effects on the information dissemination that such measures can have. The effect received, depends basically on two conditions. On the one hand, the effect will depend upon how much information already reaches the gatekeeper's colleagues directly via their own contacts with external information sources. On the other hand, it will depend upon which persons the

gatekeeper is in contact with and what is transmitted in these contacts.

If the gatekeepers are responsible for only a smaller portion of the R & D organizations information input the effect of an improvement of the gatekeeper's exposure to external information will be small. Since the gatekeeper, according to definition, already has a relatively intensive utilization of information, it can also be questioned how much more information he will be able to receive. The gatekeeper's share of the organization's information input and free capacity are therefore important prerequisites if Allen's recommendation is to give the desired effect.

If the gatekeeper first of all is in touch with colleagues within the organization that already have good access to external information, the dissemination effect will be less than if he is in touch with a larger group persons who has a low exposure to external information. An important factor here can also be who takes the initiative to the contact. If the gatekeeper is passive i e supplies information mainly at his colleagues' own initiative, the information transfer tends to become dependent upon the demand for information - i e on the subjectively experienced needs of the colleagues. If the gatekeeper is active, looks up his colleagues, the procurement of information tends to be guided by the supply of information - i e it is determined by his access to and evaluation of the incoming information.

Who talks to whom?

The gatekeepers choice of discussion partners is most likely governed by his colleagues access to information. If he approaches a colleague who has equal or greater access to information, the outcome of the discussion will most likely be greater than if he approaches a colleague with less access to information.

To discuss with a colleague who is "equal" is of importance for the efficiency in the communication. This has, among other things, been stressed by Coleman et. al. (1966) in a study of the communication between medical doctors:

> "If both members of a pair are exposed to the same source of information they can talk over together their information. If both have read a particular medical journal, for example, they are more likely to talk about an article in it than if one has read the journal and the other has not." (p 146)

A certain degree of similarity in exposure to the media is required in order for the conversations to be meaningful. On the other hand, the probability for exhange of news decreases if both have the same information habits.

The two-step flow hypothesis implies that we tend to direct our choice of discussion partners to the persons that have good access to information. If this also applies to gatekeepers, they would first of all get in contact with other colleagues who are well-informed. In this way, the two-step flow would, in fact, lead to increased information gaps, rather than as many have hoped, to reduce them. This elitistic tendency can to a certain degree, be compensated by the less informed looking up the gatekeeper on their own initiative - but

then it will still be a question of a demand-controlled transfer of information.

The choice of communication partners is also most likely governed by structural factors. Allen (1977), as many others, has found that gatekeepers usually have superior positions in the R & D organization. Studies of informal communication in organizations, have shown that proximity, similar tasks and interests govern the choice of communication partners (Scott 1973). These factors are also related to the hierarchical levels, so that persons with similar physical location interests, tasks etc are found on the same hierarchical level. A strategical issue will then be to investigate to what extent the hierarchical structure prevents persons at lower levels to come into contact with colleagues at higher levels who are well-informed.

Who talks to whom about what?

In order to judge the effects of the informal information dissemination in R & D organizations it is not enough to study who talks with whom. We must also know what they are talking about. At the present time there have been no studies made of the contents of such discussions. Some preliminary assumptions can still be made.

Provided that the R & D work is divided between different people, the contents of the discussions can be assumed to vary according to the interacting persons' tasks, interests, and formal status. For example, it can be assumed that communication between persons who have different hierarchical positions, contains a greater degree of control and directive, than if communication takes place between persons who are on the same level.

It can be asked to what degree it is probable that a gatekeeper in a superior position relates the contents of a scientific journal to a colleague in a subordinate position. Won't he save this information until he meets the colleague who is interested or he meets some superior person who can more markedly reward him for the "discovery"?

To analyse the content of the communication we naturally need to make other types of observation in the study of communication in R & D settings. To a great extent, we lack examples of studies based on participant observation or attempts to classify the contents of the discussions. Usually we have been satisfied with asking research worker's and technicians about whom they talk with and have completely or partly ignored what is being said.

An empirical illustration

To illustrate parts of the discussion above, we can here refer to a study of a Swedish R & D organization at a research-intensive pharmaceutical firm. This R & D organization is constructed as a matrix organization. It consists, on the one hand, of a number of different departments which represent different phases in the innovation process and, on the other hand, of projects where specialists from different departments are brought together to develop new products. The matrix organization is relatively common in these kind of organizations and allows for a relatively large degree of flexibility in the work organization.

A survey was taken among the persons involved in the R&D work. From a total of 150 persons, 133 answers were

received. The questions covered a number of statements about which information sources that were utilized in everyday work, as well as a question about which persons in the organization they usually discussed scientific and technical problems with. Even though a relatively large number did not answer the last-mentioned sociometric question (30 %), this investigation can still serve as an illustration of how the contact pattern can be built up in an R & D organization.

There is a positive correlation between exposure to external information and how many times a person is mentioned being a discussion partner. This agrees well with the results Allen and others have found. Thus, persons having both good contact with external information and many internal contacts, can be found (See Table 1).

Table 1. Number of external information sources used and the number of times a person was mentioned being a discussion parter (choices received).

Number of external information sources	Choices received 0-2 choices	3 and more	Total
0-3 sources	46	8	54
4 or more sources	25	12	37
Total	71	20	91

Yules Q = .47

The strategic question is now if the choice of communication partners is a function of the chosen persons access to information or of some other factor. A counter-hypothesis could be, that the choice is governed by the persons position since it is known that the exposure to external information is closely related to a persons hier-

arhical position in the organization. In Table 2 we see that the correlation that we find in Table 1 is only found in the higher positions. Thus, a superior position seems to be an important prerequisite in order for a person to serve as a gatekeeper. These results are very close to those found by Allen and others, where the majority of gatekeepers were so-called "first-line supervisors".

Table 2. Hierarchical position, sources used and choices received.

	Subordinate		Superior	
	0-3 sources	4 or more	0-3	4 or more
0-2 choices	15	11	21	12
3- choices	3	2	5	10
	Yules Q = .04		Yules Q = .56	

However, now the question is, who is in contact with whom. So far, we have only shown that there is a tendency to contact persons in a superior position, who have good contact with external information sources. But which persons contact these and which persons do they themselves contact?

In order to receive an answer to these questions we can compare the characteristics of the choosing and the chosen individual; i e use sociometric choices as "units of analysis", instead of individuals. In Table 3, below, we present an aggregated sociomatrix, where the journal reading habits and the positions of the choosing and the chosen individuals are compared.

Is there any trend in these choices? By calculating how these choices would have been distributed if the choices had been made completely at random, regardless of a certain characteristic, such trends can be estimated. (The expected frequencies (E) are stated in Table 3).
In Table 3 we also find the values for this trend using an index developed by Coleman (1958). This index, h_a, may vary between -1 and 1, where positive values show a trend towards more choices of a certain group and negative values show a trend towards less choices than if they had been made at random.

Table 3. Distribution of sociometric choices with regard to hierarchical position and number of journals read by chooser and chosen.[1)]

			CHOOSER: Subordinate		Superior		
			up to 9 journals	more than 9 journals	up to 9 journals	more than 9 journals	
CHOSEN: Subordinate	up to 9 journals	O	13	7	0	8	
		E	28	20	11	26	
		h_a	-.54	-.65	-1.0	-.69	
	more than 9 journals	O	6	6	3	11	
		E	14	10	5	13	
		h_a	-.57	-.40	-.40	-.15	
Superior	up to 9 journals	O	12	11	10	10	
		E	16	12	6	15	
		h_a	-.25	-.08	-.17	-.33	
	up to 9 journals	O	45	33	17	44	
		E	20	15	8	19	
		h_a	.42	.43	.41	.46	
	N of choices		79	57	30	73	236
	N eligible		47	23	27	35	132

1) O=observed frequencies, E=expected frequencies, h_a=index of homogenity

In Table 3 it is seen that there is a tendency to choose discussion partners among those superior persons who read many journals, regardless of the characteristics of the choosing individuals. Note that this tendency even applies for those who read many journals, which supports the earlier presented hypothesis about the tendency towards increasing information gaps. Of course those who read fewer journals have contacts with those who read many journals - but then it takes place on the initiative of the "poorly informed".

The results show that there exists no decisive structural hindrance for the communication - even though a person has a low position and a low exposure to external information, he can discuss with a superior who has good access to external information. The problem is rather the direction of the communication; who takes the initiative?

The observed tendency towards clique formation among the well-informed superiors can here be compared to the expression "gatekeeper network" which was also introduced by Allen. However, gatekeeper network implies that persons who are poorly informed can be reached by external information rather in third- hand and not after two steps as the two-step flow hypothesis implies.

One condition, that we often tend to disregard, is the fact that there are persons in the organization that have good contact with external information sources but who are seldom contacted for discussion. In our study there are 25 such persons (see Table 1) i e twice as many as can be assumed to serve the purpose of gatekeeper. Taylor (1972) identified 24 gatekeepers and 60 so-called "external communication stars". Wouldn't it be more fitting to go to these persons rather than to

those well-informed who already have many contacts?

Discussion

The conclusion of the discussion so far is, that the two-step flow model gives us very little information about how communication in a R & D setting actually takes place. The two-step flow model does not tell us who communicates with whom, how much or what information is transferred in the communication. This is why it is also difficult to comment on what dissemination effect gatekeepers can give rise to.

The empirical data that have been accounted for indicate that the choice of communication partners tends to increase the differences in contacts with external information rather than to reduce the gaps between those who have good and those who have poor access to information respectively. When the exposure to external information as well as to internal communication is governed by the structure of the organization, the discussions about internal communication in a R & D setting ought to, to a greater extent, take place on the level of the organization instead of on the level of the individual, as has been the case up until now.

The need to concentrate communication research on the study of communication relationships rather than on individuals, has been pointed out by Rogers (1973):

> "Historically, most communication research has focused on individuals as units of analysis, largely ignoring the importance of communication relationships as units of analysis." (p 305)

Even though the empirical data used in the above has a poor reliability, the analysis shows a practicable way to study internal communication in R & D organizations.

On the theoretical level there is a need to specify the hypotheses of how exposure to external information takes place and which principles govern the structure and contents of the internal communication. To begin with, there is reason to integrate theories from communication and organization research.

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